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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/681,217	10/09/2003	Moon-chul Lee	277/018	8341

7590 07/19/2005

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EXAMINER
CHEN, KIN CHAN

ART UNIT	PAPER NUMBER
1765	

DATE MAILED: 07/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/681,217	LEE ET AL.
	Examiner	Art Unit
	Kin-Chan Chen	1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.
2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-9 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) 1-9 is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a)☒ All b)☐ Some * c)☐ None of:
1.☒ Certified copies of the priority documents have been received.
2.☐ Certified copies of the priority documents have been received in Application No. _____.
3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, line 8, applicant states "eliminating any remaining patterning material". However, the last line, applicant states "eliminating the material layer". It is unclear when the material layer is eliminated because the material layer is also the patterning material.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-9 are rejected under under 35 U.S.C. 103(a) as obvious over Umetsu (US 6,690,032) in view of Shimizu et al. (US 6,618,200; hereinafter " Shimizu").

In a method of forming a device, Umetsu teaches etching a via hole through a glass wafer. Umetsu teaches that a material (hardmask) may be deposited on an outer surface of the glass wafer. The sandblasting or wet etching process using hydrofluoric acid solution may be used for etching to form a via hole having a smooth surface. The ultrasound or laser beam process may also be used. Hence, it would have been obvious to one with ordinary skill in the art to use any one of the aforementioned processes or combination thereof for etching to form a via hole because each of which has been used for same purpose of etching to form a via hole. The combination of two processes to form a via as stated above is considered reading on applicant's limitations of performing a first etching to form a preliminary via hole (e.g., sandblasting in claim 3; ultrasonic or laser beam in claim 4), and performing a second etching to form a via hole (e.g., wet etching in claims 8 and 9) and extending through the glass wafer (col. 8, line 64 through col. 9, line 4). After the etching, it is expected to remove the mask (so-called material layer) because it is not needed for the final product.

Unlike the claimed invention, Umetsu does not teach the material layer may have a selection ratio higher than that of the glass wafer (e.g., may be formed of polysilicon). In a method for etching a glass substrate, Shimizu teaches that the mask (or protection layer) for etching may be formed of polysilicon; the back side may also has the protection layer (col. 11, lines 1-8; 27-37; col. 12, lines 33-36). Hence, it would have been obvious to one with ordinary skill in the art to use polysilicon as taught by Shimizu in the process of Umetsu because Shimizu teaches that it is resistant to the etching operation in the process. Furthermore, since the same material (polysilicon) is used on the glass wafer as instantly claimed, it is expected that the material layer may have a selection ratio higher than that of the glass wafer.

As to dependent claim 5, the claimed invention differs from the combined prior art by specifying that during the first etching, the via-patterned portion is etched to a sufficient depth so that the via hole has a bottom adjacent to another side of the material layer. However, same are merely a matter of choices of design depending on the product requirements, it would be obvious to one skilled in the art to use various dimensions (e.g., etching depth of the first etch) for fabricating a device in order to accommodate the specific product design and meet the product requirement.

As to dependent claims 6 and 7, because Umetsu teaches that the mask may be provided in a pattern corresponding to the through hole, then sand blasting is performed. Hence, it would have been obvious to one with ordinary skill in the art to use the mask for sandblasting (so-called film resistor having a large resistance to sandblast etching in claim 7) on the upper surface of the material layer (which is the mask for wet etching) when the combination of two etching processes are being applied for etching a via hole as described above.

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (703) 305-0222. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (703) 305-2667. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-2934.

July 15, 2005

Kin-Chan Chen
Primary Examiner
Art Unit 1765